

PetroSkills®

2016 Reliability Engineering Training Guide



OGCI®

John M. Campbell

RDC



Reliability Engineering

Course Progression Matrix

The following instructors have been selected and approved by the PetroSkills Curriculum Network:

MR. RON FREND

MR. BILL KEETER

Reliability Engineering

RISK BASED INSPECTION – REL-61

PROCESS PLANT RELIABILITY AND MAINTENANCE STRATEGIES – REL-5

Process Plant Reliability and Maintenance Strategies

– REL-5

INTERMEDIATE

This course is designed to teach reliability engineering skills as they apply to improving process system reliability and developing maintenance strategies. You will use modern software and analysis methods to perform statistical analysis of failures and model system performance, plus develop maintenance and reengineering strategies to improve overall performance.

DESIGNED FOR

Maintenance, engineering, and operations personnel involved in improving reliability, availability, condition monitoring, and maintainability of process equipment and systems. Participants should have foundation skills in statistical analysis and reliability techniques for equipment.

YOU WILL LEARN

- Improving reliability in new facilities/systems
- Reliability design for maintainability
- Developing initial maintenance strategies
- Virtual equipment walk-down; criticality using simulation and modeling; developing baseline condition monitoring programs; developing lubrication programs; and developing process-specific maintenance strategies with reliability-centered maintenance (RCM)
- Improving reliability in existing facilities/systems
- Analyzing process reliability plots to determine the amount of opportunity
- Continuous improvement through failure reporting, analysis, and corrective action systems (FRACAS)
- Developing policies and procedures; developing failure reporting codes; statistical analysis of failures using Weibull; and developing root cause analysis (RCA) programs (triggers for RCA and analyzing recommendations)
- Developing maintenance strategies with condition monitoring
- Identifying applicable condition monitoring methods; using criticality to determine level of condition monitoring application; and reporting asset health
- Developing maintenance strategies with RCM
- Developing policies and procedures; identifying systems for analysis; analyzing recommendations with simulation and modeling; and implementing recommendations
- Monitoring results
- Understanding the true purpose of key performance indicators (KPIs)
- Developing appropriate reliability and maintainability KPIs

COURSE CONTENT

Criticality analysis • Availability simulation and modeling • Statistical analysis of failures using Weibull • Maintenance strategy development; condition monitoring; reliability-centered maintenance; and essential care • Process reliability analysis • Root cause analysis • Failure reporting, analysis, and corrective action systems • Key performance indicators • Reliability definitions

2016 Schedule and Tuition / 5 Days

HOUSTON, US	9-13 MAY	US\$4150
ORLANDO, US	28 NOV-2 DEC	US\$4210

Risk Based Inspection – REL-61

INTERMEDIATE

The risk-based approach requires a systematic and integrated use of expertise from the different disciplines that impact plant integrity. These include design, materials selection, operating parameters and scenarios, and understanding of the current and future degradation mechanisms and risks involved. Risk-based methodologies enable the assessment of the likelihood and potential consequences of equipment failures. Risk-Based Inspection (RBI) provides companies the opportunity to prioritize their equipment for inspection; optimize inspection methods, frequencies, and resources; and develop specific equipment inspection plans. This results in improved safety, lower failure risk, fewer forced shutdowns, and reduced operational costs.

DESIGNED FOR

Inspection maintenance, production, and other plant engineers and technicians responsible for the safe on-going operation of pressure-containing equipment in oil and gas facilities.

YOU WILL LEARN

- To apply fundamental principles of risk analysis, using practical application through case histories and a step-by-step evaluation process for each type of damage mechanism
- To quantitatively determine probability of failure of pressure equipment, analyze consequences of failure, and develop an appropriate inspection plan
- About the fundamental principles of component integrity, application of the API rules, material properties of strength and toughness, and the introduction to stress and fracture mechanics
- How to assess the integrity of equipment and make projections about remaining useful life
- Assessment of existing static equipment to increase the equipment capacity and to extend service life; API 579-1/ASME FFS-1
- To apply and use API RP 580 and API RP 581 recommended practices; for pressurized components (e.g. pressure vessels and piping), these assessments can be used to determine optimum inspection intervals through the considered application of ASME section V NDE techniques

COURSE CONTENT

RBI philosophy based on API RP 580 • Risk-based decision making fundamentals and tools • Technical integrity and mechanical properties of pressure equipment • Understanding and managing risk • Fires, vapor cloud explosions (VCE), and boiling liquid expanding vapor explosions (BLEVE) • API risk-based inspection methodology • Damage mechanisms affecting pressure equipment in the oil and gas industry • Non-destructive examination techniques (NDE and NDT) • API RP 581 Part 1, Part 2, and Part 3 • Fitness for service assessments using API 579-1/ASME FFS-1 • Inspection plan development and implementation • RBI rollout and management

2016 Schedule and Tuition / 5 Days

HOUSTON, US	17-21 OCT	US\$4150
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- Geophysics
- Petrophysics
- Reservoir Engineering
- Well Construction/Drilling
- Production & Completions Engineering
- Unconventional Resources
- Integrated - Heavy Oil
- Petroleum Data Management

Facilities

- Gas Processing
- Process Facilities
- Water & Corrosion
- Offshore
- Pipeline
- Instrumentation, Controls, & Electrical
- Mechanical
- Reliability Engineering
- Procurement/Supply Chain Management
- Refining

Operations & Maintenance

Health, Safety, Environment

Petroleum Business and Professional Development

- Petroleum Professional Development
- Petroleum Business
- Project Management

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